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COMMITTEE ON THE PEACEFUL
USES OF OUTER SPACE

IMPLEMENTATION OF THE RECOMMENDATIONS OF THE SECOND UNITED NATIONS CONFERENCE ON THE EXPLORATION AND PEACEFUL USES OF OUTER SPACE

International cooperation in the peaceful uses of outer space: activities of Member States

Note by the Secretariat

Addendum

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*This document has not been formally edited.

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INTRODUCTION

1. In accordance with a recommendation of the Committee on the Peaceful Uses of Outer Space at its thirty-seventh session, Member States have submitted information on the following topics:[1]

(a) Those space activities that were or could be the subject of greater international cooperation, with particular emphasis on the needs of the developing countries;

(b) Spin-off benefits of space activities.

2. The information on those topics submitted by Member States as of 30 November 1994 is contained in document A/AC.105/592.

3. The information on those topics submitted by Member States between 1 and 31 December 1994 is contained in document A/AC.105/592/Add.1.

4. The information on those topics submitted by Member States between 1 and 27 January 1995 is contained in document A/AC.105/592/Add.2.

5. The present document contains information on those topics submitted by Member States between 28 January and 6 February 1995.

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[1] Official Records of the General Assembly, Forty-ninth Session, Supplement No. 20 (A/49/20), paragraph 29.

REPLIES RECEIVED FROM MEMBER STATES

REPUBLIC OF KOREA

[Original: English]

A. International cooperation in space activities

Space technology holds great promises for technological and economic development of a country because of its spin-off benefits in other fields of technology. International cooperation in space activities is much needed to utilize those possibilities for the advancement of the welfare of all mankind. Increased international cooperation will help both the late-starters in the field of space like the Republic of Korea and advanced countries, by helping in the reutilization of existing facilities - providing the means for the reduction of expenses and the time required to develop such a project. The developed countries' expertise in design, manufacture, assembly, testing and application can be effectively transferred to the developing countries by working through a mentorship system.

Recognizing the vast potential of space technology, the Republic of Korea has been engaged in developing its own space capability. Owing much to international cooperation, it saw marked progress in its space activities during the past few years. In 1992 and 1993, Korea successfully launched two scientific satellites, KITSAT-1 and KITSAT-2. The two satellites were micro-experimental types developed at the Korea Advanced Institute of Science and Technology (KAIST) with the cooperation of the British Surrey University.

KOREASAT, the first communication and broadcasting satellite, will be launched in the middle of 1995. The purpose of launching this satellite is to broaden and improve its application in the field of broadcasting and communication services. The KOREASAT and its launching vehicle are being procured from American companies Martin Marietta and McDonnel Douglas Aerospace, with Korean companies being involved in the manufacturing of the bus structure and the ground station equipment. Characteristics of the satellite system are:

Number of satellites and its usage: Two communication and broadcasting satellites

Dry Mass: 612 kg

Power: 129 Watts (direct broadcasting: 115, fixed satellite service: 14)

Reliability: More than 74% at the end of service life

Lifetime in orbit: 10 years

The Korean Aerospace Research Institute (KARI) is also planning to develop the Korea Multi-purpose Satellite (KOMSAT) System with the first flight scheduled for either 1998 or 1999. KARI is expected to jointly develop with TRW Space and Electronics Group in the United States. The Multi-purpose lightweight satellite will carry scientific, observation and communication payloads.

TRW's engineers, jointed by about 40 Korean engineers, will design, develop and build some software as well as hardware components. The baseline 400 kg KOMSAT is slated to carry a 10 m resolution Charge Coupled Device camera, supplied by TRW's teammate, Litton Itek Optical Systems for mapping the Earth's geographic features; a low resolution CCD camera, supplied by TRW for ocean and earth resources

monitoring; and three science instruments and a Ka-band mobile communications payload supplied by Korea Electronics and Telecommunications Research Institute. The science instruments include a high energy particle detector, a sensor to measure the Earth's magnetic field and a sensor to measure the ionosphere. The spacecraft has a minimum life of three years and will be positioned in a 685 km sun-synchronous orbit.

As another example of the international cooperation in space activities, KARI has been developing a fine digital sun sensor for the attitude control of the satellite, with the Beijing Institute of Control Engineering (BICE) in China. The project which began in mid-August, 1994 is scheduled to last for approximately 5 months. While the BICE is in charge of developing the optical head of the digital sun sensor and then providing it to KARI, the processing circuitry of the sun sensor is to developed by KARI, and KARI is to integrate the parts.

The Republic of Korea also attaches great importance to multilateral cooperation in space activities. Consequently, the Republic of Korea hosted the United Nations Workshop on Space Communications for Development during 1992 in cooperation with the Office for Outer Space Affairs (OOSA) as part of the United Nations Programme on Space Applications. At this workshop, the Republic of Korea was designated as the site for the Secretariat of the Asia-Pacific Satellite Communication Conference, which was established in November 1994. In cooperation with the Secretariat, it hosted another workshop on satellite communications this year. The Republic of Korea has also participated actively in the activities of the Multilateral Cooperation in Space Technology and Application, which was established in China in December, 1992. In January 1994, Thailand hosted the first conference of the Asia-Pacific Multilateral Cooperation in Space Technology and Application. The conference decided the second and the third hosting countries to be Pakistan and the Republic of Korea respectively.

B. The development and launching of a sounding rocket by the Republic of Korea

The first Korean scientific rocket was successfully launched from a mobile launching pad in June 1993. The purpose of the mission was to investigate the ozone layer 40 kilometres above the Korean peninsula. In carrying out the investigation of the ozone layer, the Republic of Korea has not only fulfilled its global responsibility by actively dealing with the problem of protecting the environment, in which the action was consistent with the common interest of all humankind, but has also shown its capability of designing and manufacturing a rocket, the foundation of space technical activities.

The payload in the scientific rocket, including four radiometers and a sun sensor with an axis attached to the surface of rocket, also contained equipment designed to measure the ozone layer and the solar aspect angle once the rocket was launched. The ozone instruments, consisting of phototubes and interference filters measured the quantity of absorbed solar radiation. The sun sensor with a photodiode array detected the angle of the light emitting through the slit on the surface of the rocket, measured the angle between the rocket axis and the light, and made it possible to compensate the solar aspect angle change. The amplitude of the measured signal had the range of 0-5 volts, and was transmitted to the ground station at the rate of 160 kbps in the S-band frequency range.

The measured value has had the maximum concentration of 5×10^{12} cm $^{-3}$ of ozone around 25 km from the surface. The value has indicated that the condition of the ozone layer over the Korean peninsula can be considered normal.

The single stage scientific rocket developed in 1993 has the following characteristics;

- length: 6.8 metres;

- weight: 1.4 tons; and

- diameter: 0.42 metres.

The performance of the rocket was important in that it reached the maximum altitude, not considering either the descending distance or the dispersion diameter. The rocket was designed to minimize the dispersion diameter by rotation of the rocket with the canted fins and to carry out its mission at a maximum altitude of 75 kilometers, depending on the launch angle and payload weight.

The mission of the first scientific rocket was to check its technical performance and to investigate the ozone layer after reaching up to 39 kilometres altitude and flying for 3 minutes until its impact into the ocean. Taking advantage of the performance of the first rocket, the mission of the second scientific rocket, launched also in 1993, was to improve its capacity to reach the maximum altitude of 49.4 km. Both the first and second rocket were to observe the distribution of the ozone layer above the Korean peninsula through ozone measurements and measure the launch vehicles temperature, stress, pressure and acceleration. The measured data were successfully transmitted to the ground station.

UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND

A report entitled UK Space Activities, 1993-1994, produced by the British National Space Centre, has been made available at the thirty-second session of the Scientific and Technical Subcommittee.